TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

COVER: East River Drive in the Borough of Manhattan, New York. Photograph by the Department of Borough Works.

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Robert O. Swain, *Editor*

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Associate Technical Editors: F. B. Crandall, H. M. LeRoy.

Business Staff:

Norman Damon, *Circulation Manager* -- Russell Harrison, *Advertising Manager*
Joseph Havenner, *West Coast Circulation Manager*

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Frankly Speaking

DURING OUR recent trip to Europe we read in a local newspaper that one of the most amazing things about America, according to a European businessman who had recently visited here, was the obedience to traffic rules and regulations demonstrated by both motor vehicle operators and pedestrians. He is quoted as saying that had Europe as many vehicles as Americans, most Europeans, if they continued their present driving and walking habits, would be dead.

This observation should bring a great deal of self satisfaction to the hundreds of American public and private safety leaders who have fought to promote the motor vehicle as evidence of a higher standard of living and not one to hamper life.

That U. S. safety leaders will rest on no laurels was developed last month in Chicago at a meeting of the Conference Committee of the President's Highway Safety Conference. Although the national fatality rate has been reduced in the last two years from 12.0 to 7.7 for each 100,000,000 miles of vehicle travel, the goal has been set for 6.0 per 100,000,000 vehicle miles by May 10, 1949.

It is hoped that future visitors to our country will be even more amazed at the respect American motor vehicle operators have for each other and for pedestrians.

Robert O. Swain

Editor

1947 Accident Causes

by ROBERT A. BURCH, *Assoc. Mem., ITE*

THERE IS MUCH OPINION and little true fact available in any state as to the true "causes" of motor vehicle accidents. It is rare that Central Accident Offices of governmental agencies attempt analysis in terms of "cause". And yet, a rational program of prevention should be based upon factual data as to cause.

There are many valid reasons for the failure to make such analysis.

First: Almost all accidents are a result of a complex group of causes, and it is difficult to appraise the contribution of any single factor or group of factors. Second: It is necessary to incorporate personal opinion through the injection of individual judgment of the reporter and analyst. Third: Many accident reports are not complete as to the information necessary to determine their causes. Finally, some of the reported information may have been received second-hand, or may have been sub-consciously expressed to favor or aid the driver. Therefore, it is readily seen that accident analysis is an art rather than a formulated science.

Accidents Are "Caused"

It is the premise of the writer that all accidents are caused, and do not merely "happen". Upon this premise all accident reports which have been received by the Traffic Engineering Department (North Carolina State Highway and Public Works Commission) have been carefully studied and assigned causes. Best unbiased judgment has been used to assign a primary cause to each accident, with contributary causes assigned when they were in evidence. A majority of the accidents were coded with only one cause, while others were coded with as many as four causes. An average of 1.3 causes were assigned to each accident. In the final analysis a weighted total was secured by assigning a value of 10 points for the primary cause, 6 points assigned to the secondary or most important contributary cause, and a value of 4 points was assigned to all other contributary causes. It was decided that the accidents would be assigned one or more of 22 different causes, 8 being driver causes, 7 highway causes, and 7 other miscellaneous causes.

All accepted treatments or means of preventing accidents are generally grouped under education, enforcement or engineering. Since the State Highway Commission has duties controlling only one of these preventive treatments for accidents, the summary was prepared primarily to secure information to determine the relative effect of highway deficiencies on accidents.

The summary of calendar-year 1947 Motor Vehicle Accidents prepared by the North Carolina Department of Motor Vehicles reported 12,511 accidents, whereas records available to this office cover only 5,787. The accident records received by this department are carbon copies of the reports submitted to the Motor Vehicle Department by the State Highway patrolmen. The fact that more than twice as many accidents were analyzed by the Motor Vehicle Department, is due to the fact that it also received reports from police departments, to include all urban accidents, and it also collects information from vital statistics and newspaper clippings for accidents that never have an individual official report.

Use Rural Figures

Thus all accidents classified and analyzed in this report may be termed rural accidents. The Motor Vehicle Department reported 7,126 rural accidents for 1947, which means that the sample which we employ represents about 81% of the total rural accidents that were reported in any form for the year. Due to this incomplete picture, any result would not be absolutely conclusive. However, the sample is quite large and should be stable.

The summary already published by the Department of Motor Vehicles presents many valuable tabulations regarding circumstances, conditions and action. Due to the Motor Vehicle Department's complete, and much larger sample, it is well to make a comparison of their published records with our available reports as follows:

	Motor Vehicle Department	State Highway Department
Total Accidents	12,511	
Rural Accidents	7,126	5,787
Fatal Accidents (Rural and Urban)	741	492 (Rural)
Fatal Pedestrian Accidents (Rural and Urban)	224	165 (Rural)

After all accidents were classified and a weighted summary was made, it was found that the results are as follows:

Driver Causes	73.3%
Highway Causes	8.1%
Miscellaneous Causes	18.6%

The above percentages indicate the great need for education of drivers. The 8% caused by highway effect is small, but is high enough to demand the attention of the highway commission and its engineers. The greatest single cause of accidents was driving in wrong lane which attributed to 21.8% of all accidents. The wrong lane cause possibly should have been divided into more than one cause, because in this group, accidents were classified which involved a driver being in the wrong lane for several reasons. For example, numerous accidents were caused by a driver being in the wrong lane for the purpose of making a left turn. Also, many accidents occurred which were caused by a driver being in the wrong lane for the purpose of negotiating a pass, as well as for many other reasons.

Reckless driving and speeding were the next greatest causes, with each being responsible for slightly more than 10%. The percentage was determined for the various causes based on a weighted total, and also in terms of percentages for the primary cause. It is interesting to note that these methods give results which are quite parallel. However, there was a greater percent variation with highway causes than with other groups of causes. For example, the total *weight* charged to the group of highway causes was 8.3%, whereas, only 6.1% of the *primary* causes were charged to highway effect. This indicates that a greater proportion of the accidents charged to the highway were contributors to the accidents, rather than being the *primary* causes.

From the tabulation below of fatal accidents caused by and contributed to by the highway effects, it is interesting to note that less than half as many were primary causes as were contributary causes.

It is recognized that the 10-6-4 method of weighing is arbitrary, but no better approach is apparent. It is also admitted that a single known cause is assigned 10 points, while a group might involve as many as 24 cause points, for a single accident. Precision has not been attempted, due to the variations in the original data. It is believed, however, that the results of this study are highly indicative. The tabulations and results are attached.

SUMMARY OF NUMBER OF HIGHWAY EFFECT FATAL ACCIDENTS

	First Cause	Contributary Cause
I—Curves	6	44
J—Narrow Bridge	0	2
K—Bad Shoulders	2	1
L—Limited Sight	1	1
M—Inadequate Signs	4	2
N—Road Work or Construction & Maintenance Operation	2	0
P—Other Highway Causes	8	9
TOTAL	23	59

These percentages are quite similar to figures obtained by James S. Burch, Engineer of Statistics and Planning, on North Carolina accident causes in 1938, 1939, 1940 and 1941, in studies which he made.

It is the hope of the writer that this analysis as to *cause* will prove to be of value to all agencies concerned with motor vehicle accident prevention. It does serve to point out in no uncertain terms, the role played by the road, the driver, and the motor vehicle in the development of rural motor vehicle accidents.

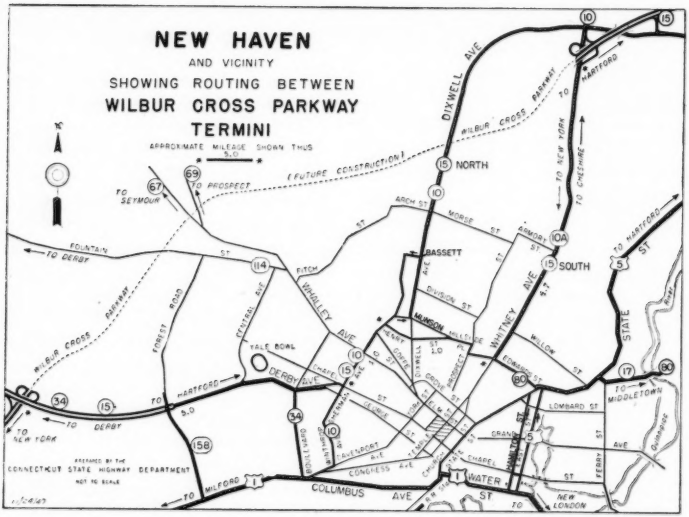
SUMMARY OF 5787 RURAL ACCIDENTS IN NORTH CAROLINA IN 1947 SHOWING PERCENT OF CAUSES

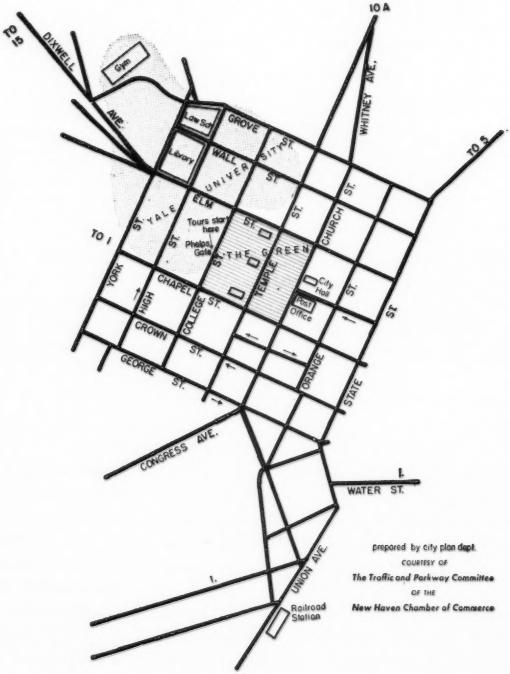
DRIVER CAUSES		
A—Reckless Driving	10.6	
B—Speeding	10.4	
C—Liquor	7.2	
D—Loss Control	3.7	
E—Wrong Lane	21.8	
F—Failure to Observe Stop Sign	4.3	
G—Other Driver Defects	10.4	
H—Failure to Give Proper Hand Signal	4.9	
TOTAL DRIVER CAUSES		73.3
HIGHWAY CAUSES		
I—Curves	2.8	
J—Narrow Bridge	.4	
K—Bad Shoulders	.7	
L—Limited Sight	.5	
M—Inadequate Signs	1.0	
N—Road Work or Construction and Maintenance Operation	.3	
P—Other Highway Causes	2.4	
TOTAL HIGHWAY CAUSES		8.1
MISCELLANEOUS		
Q—Animal Drawn Vehicle or Animal	2.1	
R—Pedestrian	4.4	
S—Bicycle	.8	
T—Mechanical Defects	5.6	
U—Weather	1.8	
W—Parked Cars	2.9	
V—Undetermined Causes	1.0	
TOTAL MISCELLANEOUS CAUSES		18.6
		100.0

FORM ROAD STUDY GROUP

Arising out of a study of the parking problem, British municipal officials have joined to form a *Road Traffic Study Group* having much the same objectives as ITE. Organizers of the group, C. G. Griffin and L. F. Dyer, point out that while there seems to be ample information in Great Britain on highway construction and transport management, "it is somewhat surprising to find very little on the overall subject of traffic management and the science of traffic engineering." Details of the new organization will be given in the August issue of TRAFFIC ENGINEERING.

NEW HAVEN GIVES TOURIST CARD MAP





Pictured above and to the right are illustrations used in a sample card map distributed to tourists to find their way in and through New Haven.

The use of these cards is based on the fact that many policemen get requests for information from out-of-town motorists, both as to through routes and for local points of interest, such as Yale University. It is planned that each policeman will carry a supply of these cards, and, in addition to verbal information will give the motorist a visual picture of the street system.

The need for this sort of information is accentuated by the present gap in the Wilbur Cross Parkway, which will not be completed until late 1949. A new connecting route—Connecticut 15—has been marked through New Haven to connect the two sections of the parkway over city streets.

The cards were adapted from maps prepared by the Connecticut Highway Department and the New Haven City Plan Department. Ed Ricker, New Haven's traffic engineer, originated the idea.

Highway Safety

by JOSEPH E. HAVENNER, *Assoc. Mem., ITE*

MUCH CONCERN is being shown by the general public for the problem of highway safety—and properly so. Highway and traffic engineers are thinking more and more in terms of the safety of the facilities which they build and operate—and this, too, is proper and timely. But there is a great deal of confused thinking related to highway safety and particularly in regard to the placing of blame for street and highway tragedies and the failure of our traffic to move with safety.

It is the purpose of this paper to comment on our present highway system and highway construction techniques as they represent development from the past, to examine the safety record of vehicle operators, to mention the challenge of present and future traffic demands, to suggest higher standards for highway design and highway maintenance so as to provide the maximum safe and expeditious movement, and to suggest how those criteria may be justified.

Progress Made

We have traveled a long road since the early days of the horseless carriage and the hazards of the machine were first recognized. We need only mention the English law that once required a horseless carriage to be "preceded by a man on foot carrying a red flag" to demonstrate the full advancement of the use of the motor vehicle. Facetiously, however, someone might suggest that the English law might be a good one for some of our modern drivers. And I understand it was seriously suggested in Wyoming that all visiting California drivers display a red flag while traversing the state. Perhaps we haven't come so far, at that.

The progress of the motor vehicle and the highway system is punctuated by two World Wars, both of great significance to that development. Prior to the first World War, the motor vehicle had developed from a novelty to a machine of real utility. At the time of our participation in the war, the demand had already started for good roads. The highway engineer was faced with a problem of developing hard-surface, all-weather roads. The objective was to get the vehicle out-of-the-mud. The first World War accelerated the development of the motor truck and, as a result, new and heavier loads were placed on our highways and the highway engineer's problem was to design a hard surface road durable under heavy loads. That the highway engineer failed to anticipate future demands of traffic at that time is manifest in the many miles of narrow, winding, concrete roads, still sound, and hardly darkened by use, yet they stand abandoned, a monument to an oversight.

Mud to Congestion

At the outbreak of the last war we had developed a system of hard-surface roads and it no longer seemed a mystery to the highway engineer how to design a concrete slab of sufficient thickness and reinforcement to withstand the loads placed upon it. Yet we were confronted with intolerable congestion in our cities and in areas of population concentration and a growing traffic casualty toll was causing national alarm. We had come

out-of-the-mud to a car in every garage.

The second World War, with its unheard-of problems in logistics, presented to the nation's motor vehicle owners a challenge of conservation, and to the highway and traffic engineer a problem of moving great concentrations of motor vehicles with efficiency.

This brings us to our problem at hand, and it is well at this point to examine the safety problem for, at the close of the war, a sudden increase in traffic accidents and fatalities brought the problem of safety into the spotlight and resulted in much discussion and confused thinking. Let's examine the record.

A table of motor vehicle accident death rates, published by the National Safety Council in their "Accident Facts", lists the traffic fatalities and the death rates on the basis of population, motor vehicle registration, and motor vehicle mileage. In 1946, the last year for which complete records are now available, 33,411 fatalities represented 24 deaths per 100,000 population, or 10 deaths per 10,000 registered motor vehicles, or 10 deaths per 100,000,000 motor vehicle miles driven. The last mentioned rate, on the basis of vehicle usage, represents a reduction of 34% in the mileage death rate during the last 10 years. This has been a steady reduction with only one year, 1941, in the last ten, showing an increase over the previous year. The death rate on the basis of motor vehicle registration indicates a similar reduction in the amount of 27% during the last 10 years and, on the basis of population, the reduction is 19%. Certainly the number of deaths in a single year, coupled with the number of non-fatal injuries of more than 1,200,000 in 1946, for example, are somewhat alarming, and represent a tremendous loss to society. The fact that the death rates are steadily decreasing, however, indicates that our efforts in the field of traffic safety are not altogether futile. While our progress appears to be slow from year to year, when we look back 10 years we can be proud of the improvements in the highways, our traffic control devices, our motor vehicles and their accessories, and we must recognize the general improvement in traffic enforcement. Many states have improved the functioning of drivers license departments and emphasis has been placed upon traffic safety education with the end result that the American motorist is driving a greater number of miles each year with fewer accidents per mile than in previous years.

The record, then, is not one to cause undue emotionalism or hysteria. But, certainly, there is great need to

The International Road Federation, unofficially formed about a year ago in Europe, was incorporated in the U. S. on June 10, 1948. The Washington office is one of two "co-equal headquarters," the other being in London. Among the objects of the federation are the education of the public and of governments in all countries of the world concerning "the social and economic benefits to be derived from adequate road systems," and to sponsor the formation of local and regional road federations throughout the world.

The U. S. office of the federation will be supported by automotive, petroleum and rubber interests. The executive director and secretary is J. H. Sembower, with offices in the Shoreham Building, Washington, D. C.

apply in greater amounts the techniques that have been developed so that even greater headway can be realized in the battle toward accident reduction.

Type of Service

We have mentioned previously the early problem of the highway engineer in developing a suitable surface for motor vehicles. We have mentioned his problem of years ago in providing access to out-of-the-way places previously only accessible to horse-drawn vehicles and pedestrians and we have recognized the highway engineer's victory over the problem presented by the development of commercial traffic on the roads which he had constructed across the country. Let us consider, now, the type of service desired by a modern highway facility. We are not now satisfied with a highway which provides durable hard surface accessibility to all points on the map. We now desire that our trips from point to point be smooth and comfortable, rapid and safe, and convenient to all of our travel desires. Having stated in general terms the end result to be achieved by our highway facility, consider for a few moments the units which our highway will serve, and some of the limiting characteristics of those units.

Driver "Ego"

Some place in the maze of design figures, drafting boards, cost estimates, and slide rules, the highway engineer all too frequently forgets that he is building a highway to be used by an average person with the psychological and physiological limitations with which we all are equipped. Examine for a moment the psychology of our average driver. He considers himself to be of better than average skill, if not superlative as a driver. Behind the wheel of his car he feels secure and imbued with a strong feeling of power. The power of 100 horses responds to the slightest touch on the accelerator. The radio of his car gives him something soothing to think about while he is driving, and if he is in the rural country having been on the highway for a few minutes he is highly velocitized, unaware that he is traveling at the once unheard of rate of perhaps 80 feet per second and his response to varying conditions is almost as if by instinct and certainly much of what he does is by habit. Now this is not a description of a malicious killer nor of a necessarily undesirable citizen. This description applies to anyone of us as we traverse our highways behind the wheel of an automobile.

A total of 16,383 boy and girl members of the school safety patrols marched along Constitution Avenue, Washington, D. C., in the A.A.A.'s Twelfth National School Safety Patrol Parade on May 15.

Thirty-five safety floats, twenty-nine bands, precision-marching drill teams, and ingenious safety slogans featured the safety demonstration which lasted for two and a half hours. It was the largest in the history of this annual event established to honor the patrol members who give daily protection to their schoolmates throughout the school year.

Hypothetically, we now have an average driver moving along our highway at a legal rate of speed, and we might find it interesting to examine his physiological equipment with which he is going to meet the situation presented to him by the next intersection, curve, or crest. Being a normal person, his vision is probably not even 20-20, so any message that we desire to bring to him, through the barrier of preoccupation which is his, must be in letters of sufficient height to be legible at a sufficient distance to allow for a

sufficient adjustment in the operation of his vehicle by the time the need for the message has been reached. Furthermore, having seen the message, our average person must have time, only a fraction of a second, perhaps, but sometimes the difference between life and death, to perceive the message and to decide upon a course of action. Having made his decision, more time is necessary for that decision to translate into action. In making a decision, what of the judgment he has used? If the situation is other than very simple, how certain can we be that his decision will be the correct one? All of these factors should be considered in every design feature of the highway, for as our average motorist drives each additional hour on his trip, fatigue begins to set in and we know that with fatigue, his vision is affected, his perception ability is dulled as is his judgment, and his reaction is decreased so that he isn't even capable of meeting average clinical standards in these departments.

Now we have placed our average driver in a rather difficult situation. He has an exaggerated opinion of his security and his ability, and he is equipped with certain physical limitations which are going to make it difficult to meet the emergency. Looking back, what have we done to develop the skill of this driver? He had to pass no intelligence test to qualify for a license—and, parenthetically, it might be mentioned that considerable evidence exists that high intelligence is little qualification for driving—he has had little if any training to qualify him as a driver, and it is doubtful that he could pass any but the simplest examination on the laws of the state in which he is driving. Is it any wonder that our average driver fails to meet the emergency? Is it any wonder that he is now a statistic in the archives of the National Safety Council, listed as a careless, negligent driver?

So much for the driver. What of the vehicle which he operates? The highway engineer certainly should take into consideration the elements of speed for which the highway is designed. For example, what are the average stopping distances for vehicles traveling at the designed speed under varying conditions? Also of prime consideration should be the variation in vehicle types and characteristics that our highways must carry. Since speed differentials, rather than speed itself, is the greatest hazard on our highways, we should make adequate provision for the slow moving vehicle.

What is going to happen to our average driver as he approaches a slight grade—only a high-speed rise in the highway for his car—but here in his path is a ten-ton truck moving at less than 20 miles an hour—presenting a sudden and unexpected obstacle in his path, which he is approaching at the rate of 30 to 40 miles per hour. Can we not find ample justification on many highways for the elimination of this hazard, on the basis of accident reduction alone, by means of the construction of passing lanes.

Assuming that we have a knowledge of the characteristics, skill, and ability of our driver and his vehicle, we are now ready to design the highway. Our problem now is not "can we build a road that will last at a reasonable cost" or "how many cars will our highway carry and at what speeds, and with what degree of safety"—we must consider the operation of the facility, the end result in service to the motorist.

Design Problems

Our problems in design are from the surface up; they are geometric problems—not structural. We must seek to minimize conflicts. We must control points of access and egress.

AMPLE PARKING AVAILABLE IN HILLS

The picture above was taken on Easter morning at the Red Rocks Theater approximately fifteen miles from Denver, where the annual Easter service was held. Some 2,100 cars are parked. Approximately 45 minutes from the time the last word was spoken on the program, this lot was entirely empty.

While this park is 15 miles from Denver, it is owned and maintained by the city. In addition to this, the Denver mountain parks cover some 200,000 acres about 25 miles from Denver. Also a part of our problem is Winter Park which maintains extensive winter recreational facilities, such as ski tows, etc., and is located approximately 55 miles from Denver.
—Henry A. Barnes

We must reduce speed differentials and sudden changes in speed. It is poor engineering that designs the structural aspects of a highway without the integration in the design stages of the signs, signals, markings, and geometrically designed features necessary to efficient operation of the facility. It should be recognized that signs reading "Slippery When Wet" and "Dangerous Intersection" in reality read "Mr. Motorist, Our Highway Engineer Failed to Consider Your Needs." The three-dimensional considerations of the drawing board are not enough in highway engineering. There must be a fourth-dimensional consideration—that of the perspective of an average man behind the steering wheel of a motor vehicle traveling at a designed speed. The relativity of motion must be a consideration at every step of the design.

Our discussion so far, no doubt, seems highly theoretical and idealistic to many. The highway engineer often is forced to compromise. He perhaps does not place half of his engineering skill into his road. The bridge engineer long ago learned where he could not compromise, for if his structure failed the collapse was dramatic and the engineer disgraced. Our highways fail less dramatically. The loss of life and property is greater but it is spread over years of operation rather than in a few seconds of collapse.

The highway engineer must find a way, and he must be assisted in finding a way, to justify the proper location of highways, the adequate purchase of

(See HIGHWAY, *page 486)*

SIGNS OF THE OPEN ROAD

Above. Here near the intersection of U. S. 13 in Delaware, it is apparent that ESSO commands greater attention than "not 13".

Right. Approaching the junction of U. S. 130 and U. S. 206, near Trenton, N. J., there is little doubt about the attention this sign commands.

—Public Roads Photo

AWARD NINE STATES

Nine states will be honored for their advancement of high school driver education it was announced following a recent meeting of the board of judges appointed by the Accident Prevention Department, Association of Casualty and Surety Companies. The board had reviewed the increases in enrollment and number of safe driving courses in 38 states and compared them with standards set by the Association in its current High School Driver Education Award Program.

The states were named to receive three types of awards. They are: Superior Award—North Dakota and Wisconsin; Meritorious Award—Illinois, Massachusetts, New Jersey, Virginia and West Virginia; Special Award—Arizona and Delaware.

Relieving Congestion

by ROBERT A. MITCHELL, *Mem., ITE*

URBAN TRANSPORTATION plays a most important role in today's civilization. The very existence of our cities depends upon highway transportation, in which I include public transit, and the most vitally affected area is the central business district.

A recent Gallup poll proves conclusively that the traffic problem is considered the number one problem in cities. In the survey, people all over the United States were asked for their loudest urban complaint. In the largest cities, over 500,000 population, 37 per cent listed poor housing and 31 per cent traffic conditions, but in all cities below 500,000 population, traffic conditions led the list with 31 per cent in medium sized cities and 19 per cent in small cities.

It has been already agreed, I believe that traffic congestion in central business districts has been largely responsible for the migration of business to outlying areas of a city, commonly known as "decentralization". Figures are available to show the tens of millions of dollars loss in central district real estate values that this has created in each of our larger cities. This at a time when the cost of operating a city has about doubled in the past ten years.

There appears, however, to be a difference of opinion between city planners and traffic engineers as to whether decentralization is harmful to a city's future. Most city planners I have talked to believe decentralization is inevitable, that it is a healthy trend and will not deter the economy or growth of a city. Traffic engineers on the other hand believe that the central business district of a city must be kept healthy and alive if the city is going to advance or even continue its present economic position.

Future Decision

Regardless of which point of view is correct, and only the future can decide, business interests and public officials in most of the cities over 100,000 population are worried about traffic congestion in the central business district. As chairman of the American Road Builders Association's Committee on Traffic, I have circulated questionnaires in over 100 cities requesting facts regarding their downtown traffic problem. Replies from 50 cities show, in the opinion of responsible city officials, that in all cases they are faced with traffic congestion in the central business districts. Officials in 44 of these cities stated definitely that congestion was adversely affecting business.

Parking Demand

In Philadelphia, for instance, in 1925, an average of 60,000 motorists drove into the central business district during a twelve hour day. Today the total is 150,000, an increase of 150 per cent which is more than the narrow streets can effectively accomodate even with parking restricted on 448 blocks of the 728 blocks in the area. When you drive into the center of the city at 9:00 A.M. you have one chance in a hundred of finding a parking space at the curb. At noon you have less than one chance in a thousand. If you patronize a parking lot or garage, you're one of approximately 100,000 motorists competing for 20,000 pay-as-you-park spaces. This emphasizes Mr. Tobin's

(See CONGESTION, *page 464)*

FIRST MISSOURI CONFERENCE HELD

Over one hundred national, state and municipal engineers attended the first Missouri Traffic Engineering Conference held recently in Columbia, Missouri. The University of Missouri played host to this important gathering as co-sponsors of the conference along with the Missouri State Highway Department, the Missouri Municipal League, the *Institute of Traffic Engineers* and the Yale Bureau of Highway Traffic. Carl Brown, Chief Engineer of the Highway Department, had previously mailed out invitations to many national organizations as well as to highway departments of all surrounding states.

After introductory speakers representing the sponsors had briefly outlined the basic aims and objectives—"to promote a better understanding of the problems of traffic control and the elimination of accidents and congestion through application of traffic engineering techniques, to further opportunity for the exchange of ideas, and to promote a wider acquaintanceship among those interested in traffic engineering"—the conference quickly settled down to an intensive three-day discussion of Traffic Surveys and Studies, Traffic Regulations, and Traffic Design and Planning. The meetings were considerably livened by the active participation of members of the Institute's Board of Direction, who had held its regular quarterly meeting in Columbia immediately prior to the conference.

Two immediate results of the conference were (1) the special resolution approved by the conference and published elsewhere in this issue and (2) a very strong endorsement by many of the continuation of similar conferences in the future.

Whereas, since 1929 relatively few engineering graduates have entered transportation service, and the Universities of the Nation have had less and less demand for transportation courses; and

Whereas, all forms of transportation have suffered from the lack of trained manpower; and

Whereas, the First Missouri Traffic Engineering Conference held in Columbia, Missouri, June 29th to July 1st, 1948 gave consideration to this problem;

Now, therefore, be it resolved that all interested persons and organizations be urged to support a move to provide more graduate work in Transportation and Traffic Engineering in the colleges and universities, and the employment at adequate compensation of trained men in all transportation fields.

"TRACKLESS" ARE POPULAR

There will be more than 7000 electric trackless trolleys running in the United States and Canada when current equipment orders are filled, according to *Mass Transportation*, a management transit publication.

Atlanta will lead with a fleet of 433 of the rubber-tired vehicles. At present, Seattle with 307 trackless trolleys has the greatest number in operation. San Francisco will purchase more than 400 of the vehicles, but contracts for the entire number have not yet been let.

The 55th annual conference of the International Association of Chiefs of Police will be held October 10-14 at the Hotel Pennsylvania in New York City.

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- If it has reflected with the *most* brilliance for the longest time—it's Prismo
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WRITE FOR THE REASONS that prove the scientific superiority of the Prismo process—the pioneer process that has been *tested by time*. Find out why Prismo is standard in many cities, counties and states for all danger points including no passing zones, fog lining and municipal marking.

PRISMO SAFETY CORPORATION, HUNTINGTON, PA.

(CONGESTION, *from page 461*) statement on the importance of providing terminals in solving the city's transportation problem.

Outline Improvements

The application of techniques developed by the traffic engineering profession for improving traffic conditions on existing streets, is the first step that should be taken to relieve traffic congestion. For instance:

1. Proper location, timing and coordination of traffic signals will provide for a much smoother flow of traffic and reduce delays.
2. Changing the direction of traffic from two-way to one-way on a pair or pairs of streets eliminates conflicts from turning vehicles, provides more lane capacity, improves traffic signal coordination and reduces accidents.
3. A system of through streets with intersecting traffic controlled by traffic signals or stop signs, no crossing of traffic at minor streets and the elimination of left turns on the through street during peak hours, will definitely expedite the movement of traffic in and out of the central business district.
4. The substitution of buses or trackless trolleys for track bound street cars has done much to eliminate congestion and improve transit operation. This idea can not be entirely credited to Traffic Engineers and it would prove a boomerang should rubber again become scarce.

In some cases, putting into effect these improvements will relieve downtown congestion, at least for a while. In many cities, however, increased traffic on the streets has created congestion, in spite of these improvements and more drastic steps are required. In general, these are the elimination of curb parking; (in Philadelphia it was found that shoppers represented only 3 per cent of the curb parkers) the establishment of additional off-street parking facilities; plans for express highways to tap the district, and a long range program looking towards the building of off-street parking and loading space in or adjacent to new or altered buildings which are generators of traffic.

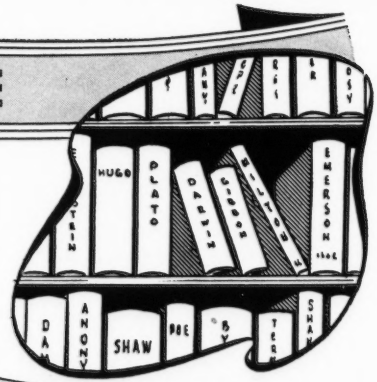
Each City Different

Each city has its own peculiarities and characteristics, therefore, methods that work in one, might not be applicable to another. It is not too difficult for an experienced traffic engineer to recommend workable improvements after a careful appraisal of the city's traffic conditions. Public opinion, however, is not usually satisfied with the opinion of an authority unless it is backed-up by facts. It is my experience that no change should be made until the proper surveys have been made to accurately determine the existing traffic and transportation characteristics. I have known several instances where parking restrictions were rescinded by city officials because they had no facts to combat the pressure from merchants who insisted that the restrictions were causing them to lose business.

Cite OD Surveys

Practically all of the information needed can be obtained from the Origin and Destination Survey combined with a check of parking conditions in the central business district. No doubt all of you are familiar with these surveys which were developed by the Public Roads Administration and completed or underway in some 60 cities. Unfortunately, over a year passes, in most cases, before the information obtained in these surveys is available for use—by that time, conditions are liable to change. I find that almost as accurate a picture of traffic conditions in a central business district can be obtained by a curb parking survey, an off-street parking survey, a shopper's mode of transportation survey and a cordon count of vehicles and people entering and leaving the district, all of which can be made and analyzed within 30 to 60 days. Philadelphia's ban on daytime parking on the streets of the central business district in 1946, was based on the information obtained in the above type of surveys. This was sufficient to convince the downtown merchants that traffic movement and not curb

SIGNS OF INTELLIGENCE



Well-marked streets and highways are a sign of a thoughtful, intelligent administration. Attractive, *smart-looking* signs that tell the motoring public what you want them to do are always welcome. *Make yours Miro-Flex!* Offered plain embossed or reflectorized . . . with glass or lucite buttons. Order from stock or to individual specifications.

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7-48

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parking was beneficial to their business. These restrictions have been in effect and adhered to for almost two and one-half years. Business has steadily improved and merchants are the first to complain against any let-up in enforcement.

Transit officials tell us we can solve the problem by making everybody ride on transit vehicles in or out of the district.

In the May issue of "The American City" magazine, Prof. Theodore Caplaw of the University of Minnesota, in an article entitled "Express Transit Streets To Speed All Traffic", suggests this as a solution other than decentralization. He says, "A third possibility is to find some way to persuade people to abandon forms of transportation which require a great deal of space per person in favor of those requiring very little. Even more plainly, it means a shift from private automobiles to public carriers for transportation in and out of the business district." His solution is based on the setting aside of express streets for the sole use of transit vehicles.

We appreciate the fact that this is theoretically true; any intelligent person can see that a street car or bus will carry many more people per square foot of roadway than a passenger automobile, normally carrying only one or two persons; but the proposal is not practical nor popular. The steady increase in automobile registration bears witness to that assertion. No, we can't solve the problem entirely by mass transportation.

The logical solution seems to be to take the following steps:

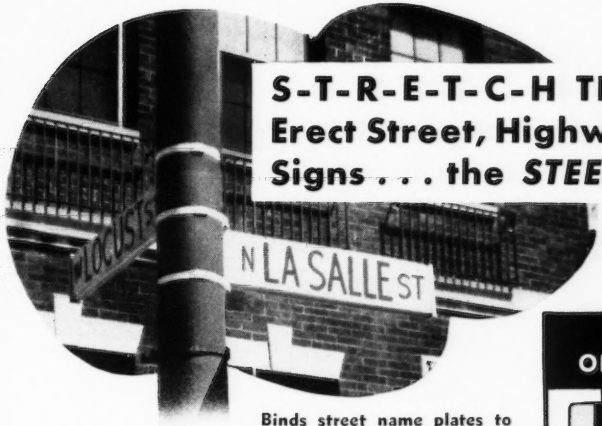
1. See that the existing street system is used to its maximum capacity for the movement of traffic and the temporary storage of commercial vehicles while loading and unloading. This might require the elimination of all passenger vehicle parking on some or all of the streets. Restricting the hours of loading and unloading would further improve traffic movement but there are a number of factors which make this a difficult thing to accomplish.

2. Make transit riding more attractive and personalized so as to encourage, at least, the people who work in the central business district to use mass transportation instead of their own automobiles. Our study showed 55 per cent of the cars parked in downtown parking lots and garages were owned by people who work downtown. Transit companies can not be expected to operate at a loss, so higher fares will be required for this type of service.

3. Provide off-street parking facilities for the passenger vehicles of the people who shop or otherwise bring business to the downtown area. If the 55 per cent of all-day parkers mentioned above could be encouraged to leave their cars home or in fringe parking lots, then only a few rather than thousands of additional off-street parking spaces would have to be provided.

4. Require the establishment of off-street loading bays for commercial vehicles in or adjacent to all new or remodeled buildings that depend upon truck transportation so as to eventually eliminate the use of the streets for loading and unloading. There is no more logical reason why the main streets of a city should be used for conducting private business than the main line tracks of a railroad. No business man would ever think of asking railroad officials to permit him to store a freight car on a main line track while it was being loaded or unloaded.

5. Improve or add to the existing street system, through a master city plan, so that it can move traffic without unnecessary delays. This would



Binds street name plates to steel and concrete standards

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COST drops, signs look trim and stay put when erected with a Steelbinder Tool and stout, corrosion resistant strap. Maintenance men like the easy way Steelbinders strap on the sign, even in cold weather, and the work saved when the sign is removed. Cement or steel standard, round, square, or irregular shape, plain or fluted surface, the Steelbinder method provides a permanent, trim looking sign mounting, saves work and material, and eases the strain on your budget dollar.

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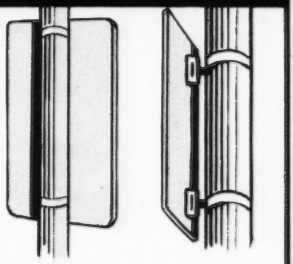
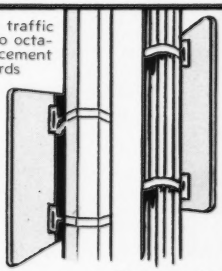


Binds traffic signs to small diameter steel standards

Binds traffic signs to smooth, round steel poles

Binds traffic signs to octagonal cement standards



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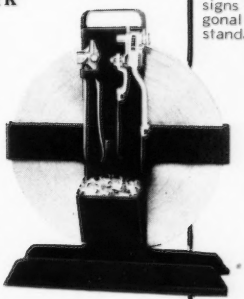

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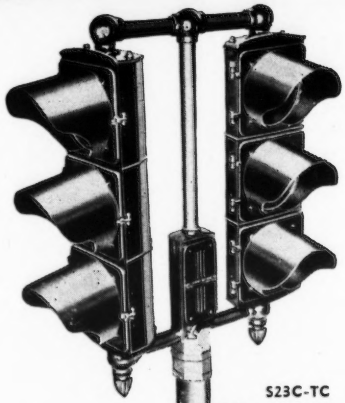

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Adjustable two-way, three light signal with terminal compartment.

Modern Engineered TRAFFIC CONTROL

is no game ... But the first move is important

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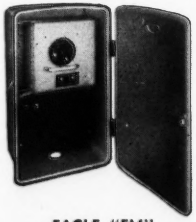

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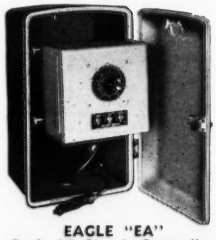
For isolated, non-interconnected intersections. (May be used in a progressive system as an isolated unit.)



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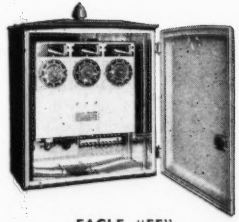

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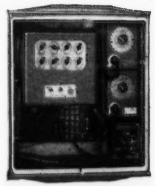
The "unit" construction controller. Ideal for progressive systems where traffic density is varied. Add cycle dial units as you need them.



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A complete line of traffic and pedestrian actuated equipment. (Illustrated: combination semi-traffic actuated and pedestrian actuated controller.)

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AT YOUR DISPOSAL

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involve some grade separated highways and the widening of some existing streets. Here again, elimination of the automobiles of workers in the district might make the existing street system adequate.

It is all well and good to talk about what should be done to relieve downtown congestion, but are we going to do anything about it? There are so many different interests affected by changes in traffic conditions that public officials hesitate to take any action for fear of displeasing one group or the other. You can take it from me, there is no traffic regulation or so-called improvement which satisfies everybody; it just isn't possible.

The answer is to organize an official citizen's advisory committee, composed of representatives from the outstanding business and civic organizations in the community. Let them get together, under expert guidance, study the facts, hash over the problems, iron out their differences and then present an agreed upon program to the city government. City officials will then proceed to see that the improvements are made because they can be assured of active support from private interests vitally affected by the changes.

NAVY IMPROVES DRIVING RECORD

Traffic fatalities involving Navy and Marine Corps motor vehicles were 75 per cent fewer in 1947 than in 1946.

This record drop in traffic deaths was the direct result of an order requiring all military and civilian drivers of Navy and Marine Corps vehicles, regardless of how many years they had been driving, take a special examination of driving skill and fitness.

Up to the time the examination was first required, on September 1, 1946, the average monthly death toll had been 21. In that month of September the figure dropped to nine. In October it was 13, in November it was 10, and in December it was down to five. The monthly average for traffic deaths remained at five throughout 1947. A striking decline in injuries and property damage also was recorded.

The Navy examination, based on standards recommended by the American Automobile Association and the Institute of Public Safety at Pennsylvania State College, is more exacting and comprehensive than that given by any state. It includes a physical test and a rigid five-mile road test through traffic. Of the approximately 200,000 individuals who have taken the test up to the present time, about 40 per cent have failed to pass.

To drive a Navy or Marine Corps motor vehicle an individual must be more than 18 years old. To drive a bus he must be not less than 21.

SUBWAY SURVEY IN NEW YORK

A survey of New York business concerns to prepare a comprehensive plan for staggering working hours to relieve rush hour congestion on the city subway lines began June 7, according to a joint announcement issued by the Board of Transportation, the city's Department of Commerce and the Commerce and Industry Association of New York, Inc.

The survey will be conducted by the Commerce and Industry Association, which already has begun the distribution of questionnaires to more than 10,000 business concerns with offices or plants south of Fifty-ninth Street in Manhattan.

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TRADE MARK REG.

REFLECTING SIGN MATERIAL

FLASHES WITH ARRESTING BRILLIANCE IN THE LIGHT OF HEADLIGHT BEAMS AT NIGHT!

State and municipal Highway sign shops find Reflectolite is truly an amazing material for highway warning signs and other standard markings. Made in sheets, sizes to fit your sign requirements, it provides the added advantages of no waste, no cracking, and easier handling. Reflectolite comes in standard yellow, white, silver, red, green, blue and camouflaged black. NOT A DECAL, it is applied with adhesive furnished by us or with the standard vacuum applicator or roller type of application.

WARNS SOONER . . .
WARNS LONGER!

Reflectolite signs warn on the darkest night or in bright sunlight. It gives the vital safety impact of overall reflectorization, so that the shape and color of each type of marker can be recognized even before the legend can be read. Investigation will prove the merit of Reflectolite for your sign shops.

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Wide Angle Traffic Yellow "Scotchlite" for warning signs.

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For Wide-Angle brilliance-
All-Weather effectiveness

Modern all-weather traffic speeds call for clear, brilliant highway signs—markers that flash their message with extra legibility, increased target value, wider angle of reflection.

That's what "Scotchlite" gives you—signs *overall* reflectorized with a sparkling, glareless, brilliance in fair weather or foul. With Wide Angle Traffic White "Scotchlite" for guide signs and Wide Angle Traffic Yellow for warning signs you have a team that gives all your highway signs the extra brilliance, extra all-weather effectiveness demanded by modern driving conditions.

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REFLECTIVE SHEETING

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BILLION-DOLLAR ROAD BILL APPROVED

A joint conference of senators and representatives ironed out differences between Senate and House versions and agreed on provisions of the Federal-Aid Highway Act of 1948, which will make available to the states $450 million for each of the fiscal years 1950 and 1951.

In addition, the conferees agreed on authorizations for forest trails and other Federal road projects bringing the total to more than $500 million for each of the two years.

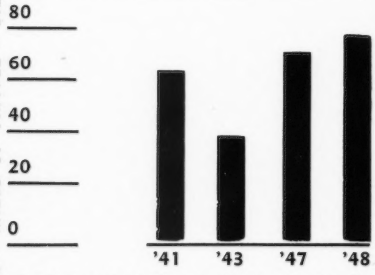
Funds under the new act will be available to the states for two years after the close of the fiscal year for which they were authorized. It is provided that the Commissioner of Public Roads shall begin to allocate the new funds before September 1, 1948, even though the first of those funds will not be available for use before July 1, 1949. The bill also provides that funds remaining under the 1944 Act shall be available to the states for an additional year of grace up to June 30, 1951.

Another important provision is an increase from 2½% to 3¾% the amount to be allowed from authorized Federal-aid funds for administering provisions of the Act and for highway research and investigational studies.

APPOINT JUDGES

Appointment of an 11-man board of judges for the high school driver education award program of the Association of Casualty and Surety Companies, has been announced by Julien H. Harvey, manager of the Association's Accident Prevention Department. The board will evaluate annual reports submitted by states on progress achieved by them in the development of high school driver education courses.

TRAFFIC TRENDS



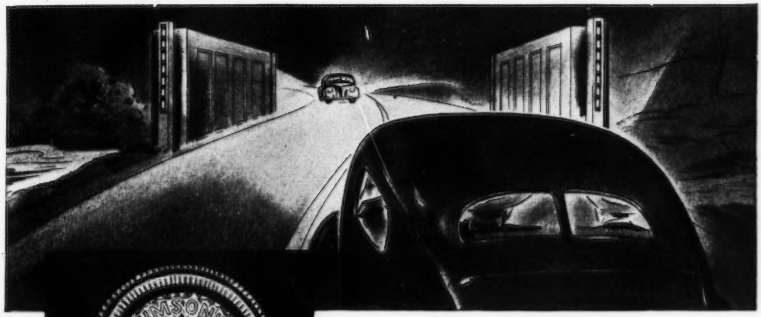
TRAVEL ON RURAL ROADS FOR FIRST FIVE MONTHS OF 1941, 1943, 1947 AND 1948.

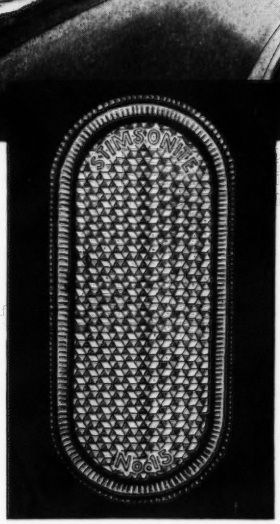
LOSE LICENSES

Nearly 430,000 motorists in the United States were shorn of their driving privileges last year because of traffic law offenses and practices detrimental to highway safety, it was revealed in a survey completed by the American Association of Motor Vehicle Administrators. The number exceeded the 1946 total by 112,000 or over 25 per cent.

The sharp rise in license suspensions and revocations, in part reflecting the record-breaking expansion of motor vehicle use, also indicates a progressive tightening of control measures to curb the dangerous driver, according to the Association's president, Lee C. Richardson, of Michigan.

ITE
MEETS
IN
OCTOBER





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Proper marking with Stimsonite Reflector bridge and culvert markers helps prevent accidents and reduces the hazards which are costly in lives, property damage and damage to structures.

The reflector is the *new* *Stimsonite No. 15 (2½-inch yellow oval). The marker is sixteen-gauge steel, Parkerized after fabrication and finished in bright Federal yellow baked enamel.

Stocked in two standard lengths: 12¼-inches with four reflectors. 20½-inches with seven reflectors.

Complete information and illustrated folder on request.

**Another FIRST for Stimsonite Plastics! Now an all plastic, one-piece reflector formed by fusing a Lucite back piece with the well-known Stimsonite Reflector. Dust and moisture proof regardless of age, weather or service.*

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METERS COLLECT FEES IN PARKING LOT

The use of parking meters in parking lots is shown in this picture from Miami Beach.
—*Miami Beach News Bureau Photo*

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- Time extension and memory features.
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COPELL REPORTS ON LIGHTING

Edgar F. Copell (Mem. ITE), chairman, Committee on Engineering, Governor's Highway Conference, Commonwealth of Massachusetts, has reported that 135 miles of the Commonwealth's urban and residential streets and highways have been lighted since the committee's recommendations at the first Governor's Safety Conference in May, 1947.

The chairman, who is traffic engineer of the Massachusetts Department of Public Works, reported as follows:

"Since the first Governor's Highway Safety Conference of May 16, 1947, substantial progress has been made in the planning and installation of street and highway lighting in accordance with the recommendations of this committee. Available data shows that the following results were obtained, classified according to the five specific recommendations of the 1947 report:

1. *Urban Streets*—In this important class of heavily travelled urban streets the most progress was noted; namely, a total of sixty-nine (69) miles of new lighting installed since one year ago.
2. *Residential Streets*—A total of forty-seven (47) miles of residential access routes has been equipped with new lighting in the past year.
3. *Highway Intersections*—A total of nineteen (19) highway intersections were lighted in the past year.
4. *Selected Highways*—While there were no installations in this classification completed in the past year, it is reported that plans have been finished and authorizations obtained for the lighting of some fifteen (15) miles of State Highways.
5. *IES, Recommended Practice*—It is particularly gratifying to report that all of the above-mentioned lighting installations have been designed to meet the standard of excellence as set by the Illuminating Engineering Society, The American Standards Association, and the *Institute of Traffic Engineers*.

"In addition to the installations referred to in the foregoing, there have been several hundreds of new street lamps installed in scattered locations throughout the Commonwealth for the purpose of improving visibility and to reduce the hazards of night driving.

"Acceptance by city and town officials has been such that plans have been made for many more miles of street lighting that will be installed as soon as authorizations and equipment become available. In general, shortages of materials have been responsible for some retardation of lighting programs which have already been authorized."

The importance of this state-wide street lighting modernization program in making the Commonwealth's streets and highways safer after dark is evident from the Committee's recommendation a year ago.

"In the Commonwealth of Massachusetts", the recommendation stated, "the rate of night traffic fatalities per million vehicle miles is four times the day-time rate; two-thirds of the fatalities occur at night with one-third of the daily traffic."

OCTOBER

PHILADELPHIA

ITE

LOOK WHAT TRAFFIC EXPERTS SAY ABOUT DUAL ADVANTAGES!

POLICE CHIEF

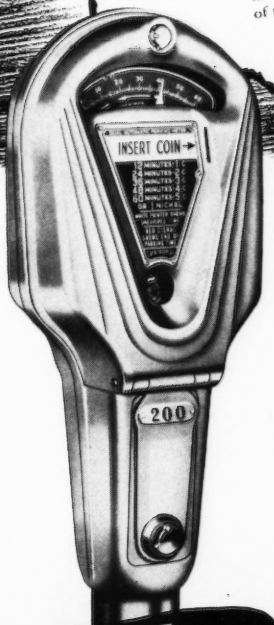
"In almost 8 years of operation our maintenance costs have been less than one cent per meter, me, is ample proof of the superior workmanship and quality of the Dual."

TRAFFIC DIRECTOR

"Dual is 'tops' . . . makes enforcement very easy."

TRAFFIC ENGINEER

"We like Duals . . . we like Dual service."



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It's easy to see why. Duals are engineered like fine time-pieces. They're accurate, precision-built instruments. They're weatherproof and tamper-proof. They operate automatically — no levers to cause servicing problems. They're ruggedly built for long, economical service. *And the meter movement —the most vital part of any meter—is made by a manufacturer of world-famous clocks.*

Before you install *any* meter, find out about Dual's many advantages. Learn about the Specialized Service that is a *plus* value for every Dual-equipped city. Write for bulletin, or ask our engineers for helpful, expert survey service.

DUAL
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. . . YOUR BEST ANSWER TO EVERY PARKING PROBLEM

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NOW AVAILABLE!

A "WET" PAINT MARKER THAT DEMANDS ATTENTION

IDEAL FOR COUNTY HIGHWAY CENTERLINE MARKING

- Easy to Read From BOTH Directions
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FOR CITY AND STATE PAVEMENT MARKING OPERATIONS

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- LEGEND "WET" ON FOUR SIDES
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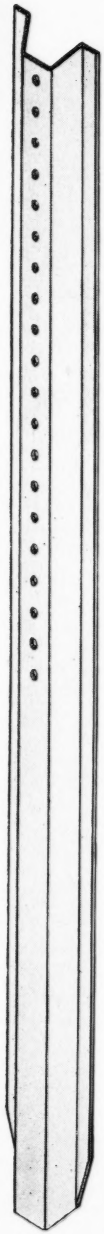

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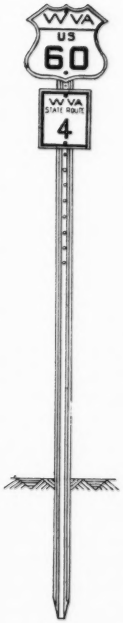

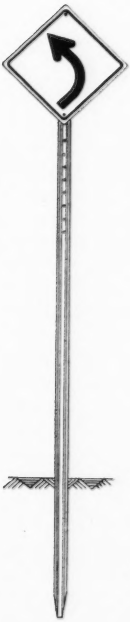

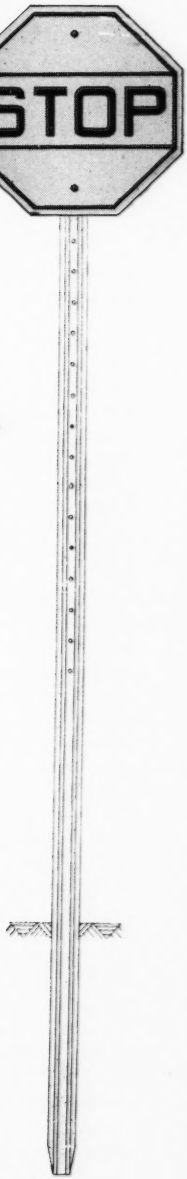

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THE HUNT COMPANY

Established 1920

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Detroit 21, Mich.

Activities . . . .

SECRETARY'S COLUMN

The nomination for officers and directors by individual member ballot, as anticipated from the report of last year's Nominating Committee, was *again* a procedural fiasco. Last year 115 ballots (40% of eligible voting members) produced 90 candidates. This year 148 ballots (43% of eligibles) produced 93 candidates. Obviously there is a definite lack of interest in this procedure, and most voting members prefer to await final balloting to choose their candidate. Again many ineligible names were submitted for nomination, climaxed by the nomination of a member who has been deceased since 1942. The problems faced by this year's Nominating Committe are no different from last year, except they have some additional flexibility in determining the number of officers to submit to the membership for final vote. As briefly reported on page 339 of the April issue, the Board of Direction has already taken action under its constitutional authority to amend the balloting procedure to conform with the high standards of a professional engineering society. These changes will be submitted to the membership along with the final election ballot, for consideration and discussion at the Annual Business Meeting. I am confident that the entire membership will agree with the findings of the Board and the recommendations of the chairmen of the Nominating Committee, that a constitutional change is both desirable and necessary to the future strength and welfare of our rapidly expanding organization. *United*—we continue to increase in stature and national recognition; *divided*—we just flounder along to the detriment of the excellent prestige we have established in our 18 years of existence.

Robert S. Holmes

EDITORIAL CITES ITE'S PRESIDENT

Bob Mitchell, president of the *Institute of Traffic Engineers*, was cited for his work in Philadelphia in an editorial appearing in the June 7th issue of the *New York Times*. The editorial follows:

CITY TRAFFIC PROBLEMS

As might be expected, a realistic approach to the city's traffic problem was made by Austin Tobin, executive director of the Port of New York Authority, at a recent meeting of the National Citizens Conference on Planning. He admitted the staggering magnitude in cost and construction necessary for essential municipal facilities. He expressed the conviction, however, that the urgency of the need would make it possible to find the new sources of revenue required. The Port Authority, with its tunnels and bridges and the great bus terminal which at last is to come into being after so long and difficult a struggle, has shown itself fully aware of the city's requirements and ready to step into the breach when the time came.

Some of the remedies for downtown congestion proposed at the conference by Robert A. Mitchell, chief of the Philadelphia Bureau of Traffic Engineering, are equally applicable to New

York. They include use of the existing street system to maximum capacity and enactment of off-street parking laws requiring facilities for shoppers and loading bays for commercial vehicles.

The traffic situation in many areas of the city has become so serious that it cannot be met by a do-nothing attitude which merely expresses dismay at the cost of remedy. The hard fact is that we have an ever-growing fleet of motor vehicles already so large as to choke the arteries of a city laid out for the leisurely pace of the horse and cart. Only bold measures can relieve the pressure, and they must be taken in the interest of all the citizens without regard to special interests.

I T E PERSONALS

JIM DARRELL has been appointed traffic engineer for Minnesota. His appointment was effective April 1, 1948.

Among ITE members attending the President's Highway Safety Conference Meetings in Chicago, June 15, 1948, were: Burton W. Marsh, Charles W. Prisk, James E. P. Darrell, Carl McMonagle, Harry Harrison, Maxwell Halsey, Matthew C. Sielski, David M. Baldwin, Donald S. Berry, G. Donald Kennedy, Thomas H. MacDonald, Norman Damon, Ned Dearborn, Harry Porter, Light B. Yost, Julien H. Harvey, Pyke Johnson, J. Edward Johnston, Franklin M. Kreml, Harry Neal, Glen Smoot, Sidney J. Williams.

CHARLES S. LeCRAW is on active duty with the Army.

JOHN B. ECKER has been promoted from Director of Research and Planning of the Capital Transit Company to Assistant to the General Manager.

GORDON K. GRAVELLE began on July 1 a two-year term on the Commissioners Traffic Advisory Board of the District of Columbia.

JOHN H. MITTON is a new father—for the fifth time.

DAVE MORRIS, former traffic engineer for the State of Washington, has taken a new position as city engineer for the City of Tacoma.

WIN CARSTEN expects to be tied up for the next year with an Origin and Destination Survey for the City of Tacoma. **WIN'S** address is Tacoma Traffic Survey, 703 Pacific Avenue, Tacoma, Washington.

CLIFF CLARK has gotten back into Traffic Engineering and accepted a position as Traffic Engineer with the Automobile Club of Southern California.

CHARLES M. UPHAM, JR., has been appointed traffic engineer of Hartford, Conn.

SECTION NEWS

WESTERN SECTION

Just a line to let you know that the Western Section of ITE is active and on its toes, and to give you the following notations:

At the call of the vice-president, Win Carsten, the members of the Northwest part of the Western Section of ITE met in Tacoma on May 22nd at the Winthrop Hotel in connection with the meeting of the Northwest Section of the International Municipal Signal Association.

Those present were: Win Carsten, E. E. Lewarch, George Howie, Arch Bollong, Dave Morris, John Schmidt and Norman Kennedy, all members of ITE.

Those who could not be in attendance were: Carl Fritts, Fred Fowler, F. B. Crandall, Al Head, J. Vaughn-Birch and C. F. McCormack.

Other traffic engineers present not members of ITE were the new State Traffic Engineer of Washington, John Higgins, and Washington State Traffic District Engineer, Rex Still.

One of the speakers on the program was Ralph Reid of West Lynn, Mass., of the General Electric Corporation.

A session attended by the ITE members was on Street Lighting and Traffic Engineering. Papers were presented on "Traffic Studies" by George W. Howie, Assistant Traffic Engineer of the City of Portland, and by Ralph Reid of the Traffic Signal Division of the General Electric Co. on "Flexibility Requirements of Modern Traffic Control", and by Arch Bollong on "Modern Traffic Safety Lighting." Bollong, Reid and Howie entered into the panels after these programs.

A social meeting was held by the ITE group at the "Top of the Ocean" in Tacoma, a beautiful ship by the sea for dining purposes, and a bull session held in the evening afterward.

The traffic engineers gained immeasurably by contact with the municipal electricians group, which contact could well be emulated in other parts of the country. Copy of letter from the secretary of the Northwest Section of the IMSA is enclosed.—Arch Bollong.

Mr. J. W. A. Bollong
400 County City Bldg.
Seattle, Washington
Dear Sir:

The members of the Northwest Section of IMSA have instructed me to express their appreciation and thanks for your attendance at the Tacoma meeting. Your paper with the associated pictures and drawings was one of the highlights of the meeting. Your assistance during the Round Table discussion was a great help and developed the answers to many questions.

The assistance of such recognized engineers as yourself to meetings such as this will make for a better and safer street and highway program.

Again our most sincere thanks and appreciation.

Very truly yours,
NORTHWEST SECTION IMSA
/s/ Don Axtell, Secretary.

YALE STUDENT CHAPTER

As a grand finale prior to graduation from a year of intensive training in traffic engineering, the Yale Student Chapter sponsored a "king size" picnic. The affair was held at Sleeping Giant Park, a favorite outdoor spot

for New Haveners, on Sunday, May 23rd. The elaborately planned menu consisted of beer, soft drinks, ice cream, beer, hot dogs and potato chips, and BEER. Wives and children were present and guests included Mr. and Mrs. Roy E. Jorgenson, Mr. and Mrs. T. M. Matson, Mr. and Mrs. Wilbur S. Smith, Mr. and Mrs. Fred W. Hurd, Mr. and Mrs. Peter P. Hale, Mr. and Mrs. Ed Ricker, Mr. and Mrs. Robert S. Holmes, their families, and the secretarial staff of the Yale Bureau of Highway Traffic and the Institute of Traffic Engineers. A **red hot** game of softball saw the Student "Newcomers" competing with the "Old Timers". The results showed the rugged individualism of the pitchers—the final score 21-20—but no one remembers which team won. The picnic might still be in progress if the park night watchman had not stepped in after dark and adjourned the gathering.

MICHIGAN SECTION

The annual election of officers was the principal item of business at the April 26th meeting of the Michigan Section, Institute of Traffic Engineers. The election results were: President, Frank C. Eisenach, Traffic Control Engineer, Michigan State Highway Department; vice-president, Holden M. LeRoy, Traffic Signal Engineer, Detroit Traffic Engineering Bureau; secretary-treasurer, Harold G. Bauerle, Traffic Design Engineer, Michigan State Highway Department.

Forty members and guests were present, and a steak dinner was enjoyed by all. Fred J. Meno and R. T. Lattin of the Detroit Public Lighting Commission gave an interesting description and demonstration of recent developments in mercury vapor street lighting.

WASHINGTON SECTION

Twenty-two members met in the Club Studio at the Hotel Fairfax on the evening of June 9, 1948, for the annual business meeting of the Washington Section.

The members elected the following officers for the year 1948-1949:

Mr. John B. Ecker, President.
Mr. LeVerne Johnson, Vice-President.
Mr. Gordon K. Gravelle, Secretary-Treasurer.

At the conclusion of the business meeting Mr. Harold Hammond invited the Washington Section to his home for a summer outing. The members gladly accepted Mr. Hammond's invitation and are looking forward to enjoying his swimming pool and refreshments again this year.

LETTERS TO THE EDITOR

Extract of letter to Bob Holmes:

I spend part time on traffic engineering, probably more on accident prevention. The trend at the moment is to transfer the responsibility for the former to the Germans. I have met no Germans qualified to handle the job so far. Evidently all those who carried the title previously were good Nazis and hence are not around now. I predict we will come back into the picture shortly. To my knowledge, Butterfield, McCandliss and myself are the only ITE members over here. The former dropped in the office a month or so ago and I haven't seen him since. Didn't know him previously. He is in transportation, I believe, and thus is practicing no traffic engineering officially.

Mac and I have picked up a rather comprehensive understanding of the German traffic system. Occasionally we are able to improve upon their methods, although such improvement is spotty. There are advantages and disadvantages to the International system as adapted here. Incidentally, it varies more than the uninitiated think, between countries over here. Generally, they mount their signs too high, and too far out front. Being symbolic, the signs are not as informative as our own. I do like their "Major Road Ahead Has Priority" sign which can be used in lieu of a stop sign. Believe it is better than our caution or slow signs for this specific purpose. One sees no one-hour, two-hour, etc., limiting on parking. Evidently they never have used this feature. In fact, they use few refinements. Little real advance is noted. Everything gets jammed up when there is any considerable amount of vehicular traffic. The route marking through cities is not too good. In many instances instead of marking a route through a city they will funnel all through-traffic on to one, or a few, route(s), and mark by "Main Route" sign, which we must admit isn't too informative for the motorist who wants to stick with some particular route. One of the big problems is the control of cyclists and pedestrians. Both are all over the streets and highways.

JAMES G. HAYDEN

YEARBOOK CHANGES

BUCKLEY, J. PAUL
Automotive Safety Foundation
700 Hill Building, Washington 6, D. C.

REID, LLOYD B.
Allied Engineers, Inc.
2680 Penobscot Building
Detroit 26, Michigan.

An exhaustive treatise on traffic engineering problems and their solutions has been published, under the title "Traffic Engineering Functions and Administration," as a guide and aid to public officials and others concerned with safe and efficient use of streets and highways.

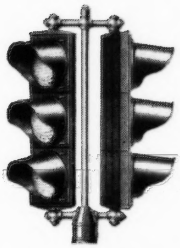
Prepared by a joint committee of the American Association of State Highway Officials, the American Public Works Association and the Institute of Traffic Engineers, the new manual is made available through the Public Administration Service, 1313 East 60th Street, Chicago 37, Ill.

D. Grant Mickle, Director of the Automotive Safety Foundation's Traffic Engineering Division, aided in preparation of the book, representing the Institute of Traffic Engineers on the joint committee. The book required three years to prepare and is expected to adequately fill a long-felt need in the traffic engineering field.

CROUSE-HINDS

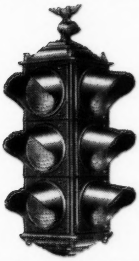
Traffic Signals and Controllers

..... a type for every purpose



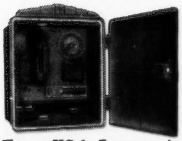
Type TRP-223D

Two-way, Three-section Adjustable Signal For Post Top Mounting



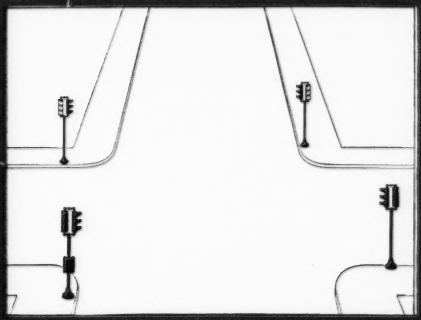
Type TSW-443D

Four-way, Three-section Non-Adjustable Signal For Mounting on a Span Wire

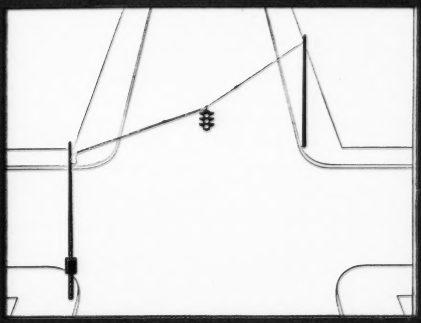


Type KS-1 Automatic Synchronous Controller

Six Signal Circuits — 4 to 16 Intervals.



Typical Installation of TRP-223D Two-Way Post Mounted Signal



Typical Installation of TSW-443D Span Wire Signal

Crouse-Hinds Catalog 226 lists a complete line of traffic signals, beacons, flashers, and a series of controllers designed to help you solve your traffic control problems ... from simple installations up to the most complex heavy traffic problem. Send for your copy.

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TRAFFIC SIGNALS · CONDULETS · FLOODLIGHTS · AIRPORT LIGHTING

(HIGHWAY, *Con't from page 459*)

rights-of-way, the proper alignment and gradient to provide safe and expeditious movement. The highway engineer must furnish factual basis for the justification of his modern design. Much of this information is now available if he will but examine it in the proper light and place it before the general public in a salesmanlike fashion. In doing this he should consider all who benefit from a properly designed highway. To the road user there are benefits in fuel savings, depreciation savings, time savings, and a reduction in the loss of lives and property due to accidents. To the non-road user there are community benefits, abutting property benefits, and the benefits to the national network of highways.

May I recommend the work of the late C. B. McCullough and the late John Beakey, both of the State of Oregon, who in an Oregon State Highway Department Technical Bulletin developed a treatise on the Economics of Highway Planning. In their bulletin the economic analysis of a highway problem is clearly set forth, demonstrating how added costs may be weighed against added benefits, and it is clearly demonstrated that all benefits are increased justification of initial costs.

The burden of developing a system of highways that provides safe and expeditious movement does not fall entirely upon the shoulders of the highway engineer. There must be proper and adequate enforcement and there must be proper and adequate education of both the highway user and of the community, but it must be recognized that enforcement and education while minimizing the engineer's problems and while reducing accidents cannot do anything toward increasing the capacity of highways or reducing the time requirements between termini. The proper design of a highway increases capacity, increases average speed, and reduces the traffic casualty toll in one operation. It is for society to say what value is to be placed upon the reduction in loss of life, property, and delay, but it remains the responsibility of the highway engineer to place before society the facts upon which an intelligent choice may be made.

START NEW TERMINAL

The Port of New York Authority laid the cornerstone on June 24, 1948 for the world's largest union motor truck terminal in Newark, New Jersey, a "post office" for over-the-road truck freight. The $7,000,000 terminal, second in a series to be built by the Port Authority, will be 1,158 feet long and 200 feet wide. It will occupy the 29-acre site south of Ruppert Stadium, adjacent to northbound and southbound Routes 1 and 25, and directly accessible to all main truck routes. A maintenance and repair station will be located at the terminal site.

Pick-up and delivery service for over-the-road carriers who operate in the union terminal will be performed by local truckmen operating "mosquito fleets" for the consolidated movement of the truck freight.

It will be a two-story structure. Space on the north side of the terminal site will be reserved for the parking of tractor-trailer units and local trucks, and will accommodate about 150 vehicles.

The terminal will have off-the-street bays for 160 trucks. The 1,000 x 100 ft. freight platform will be equipped with an overhead chain conveyor serving both sides of the island platform by means of platform trailers.

The terminal is expected to be completed in October, 1949.

Grote REFLECTOR SIGNALS FOR SAFETY AND ECONOMY

Don't be satisfied with material of low reflecting intensity that requires frequent replacement.

Safety demands reflectors of extremely high reflecting power.

Now you can standardize on Grote reflectors—for marking bridges, abutments, clearance limits, culverts, gateway entrances, road delineators or road ends.

These Grote units are equipped with Grotelite prismatic reflectors, precision molded from shatter-resisting Plexiglas. The total refraction optical principle insures brilliant reflecting efficiency at long or short instances. Grotelite reflectors do not black out in fog or rain. Housings for all units are fabricated from heavy gage rust resisting steel, finished in baked enamel.

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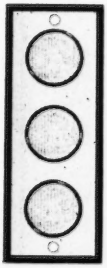

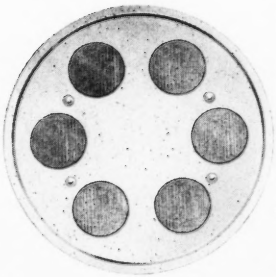

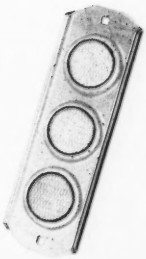

STREET NAME UNITS • REFLECTOR BUTTONS

THE GROTE MANUFACTURING CO., INC., BELLEVUE, KY.

"BEFORE A ROAD IS BUILT"

John D. Millar, Deputy Minister of Highways for Ontario, in the course of his address to the annual luncheon meeting of the Ontario Motor League, read an amusing poem by "one of the members of our staff who has a flair for putting together lines. We were commenting the other day on the troubles a highway designer has . . . and I should like to read it (the poem) to give you an idea of some of the troubles the highway designer goes through before the road becomes a reality". He then read:

When locating a road, states an old engineer,
We study, on maps, all routes which appear
To be feasible, those which we think will rate
The money we will spend to investigate.
Then the traffic is counted, since we like to know,
Where all the cars come from, and where they all go.
Next we charter a plane and these lines are all flown
Aerial pictures taken, on which detail is shown
Which viewed by an expert under a stereoscope
Permit us to say of some proposals "no soap".
Thus we narrow our choice down to two or three routes
When the field engineer takes his level and shoots
Cross sections, from which we can calculate true
The amount of earthwork, cut and fill, we must do
Then the real estate experts make a rough estimate
Of the property damage, the designers now state
The expense of all structures, so at long last we see
What the cost of the different proposals will be.
Then we re-check our figures, the whole scheme is reviewed
All angles discussed and all doubters subdued.
And then and then only we decide it is fit
To say to the chief, "Sir, we think this is it".
The proposal's made public, the man in the street
Takes a casual look and cries with some heat,
"Ye Gods, can you beat it! that dumb engineer
Proposes to build that new road over here.
Over there, I'll bet you could build it for half;
How those birds waste our money, oh, boy what a laff!"

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VISIBILITY
TUTHILL GUARD, with its convex surface and spring brackets, is safer, for two reasons. It can be seen quicker at longer distances. Its deflective action deflects cars back into highway and absorbs impact. Result—more lives saved—less damage to car and guard rail. Low upkeep cost.
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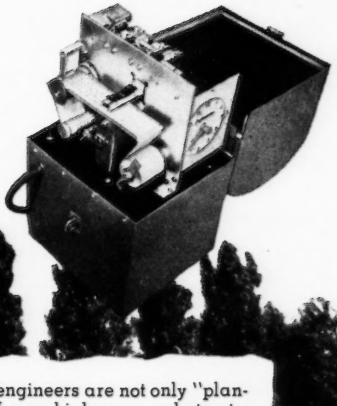
ARE YOU PLANNING AHEAD?



Many state, highway and county engineers are not only "planning ahead" for the construction of new highways and streets, but have already, through the aid of Streeter-Amet Traficounters, made extensive surveys . . . and are ready to put into operation a complete construction program, as soon as facilities and materials are available.

The Traficounter is a precision instrument . . . twice as fast as any other vehicle counter. Easy to install . . economical to operate . . . at work 24 hours a day, rain or shine. It gives facts that are indispensable to the traffic engineers who do the planning. Write for Bulletin on Streeter-Amet Traficounters.

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1726 Belle Plaine Avenue **Chicago 13, Illinois**

Personalities . . . .

Lewis W. McIntyre, third president and charter member, is one of the Institute's most versatile and active members. Street and highway design, construction work, public utility operations, draftsman, city planning, motor club management, college professor and consulting engineer are some of his accomplishments.

Mr. McIntyre is a civil engineer graduate of the University of Pittsburgh, with graduate work in public utility valuation and regulation and in electrical engineering. He is a registered professional engineer in Pennsylvania.

His start in the engineering profession was much like many others—he was a draftsman. Then he became a sales engineer for the Keystone Lubrication Company and from there to the Bureau of Engineering, City of Pittsburgh, as assistant engineer. For five years in this capacity, Lew was active in the design and construction of streets, sewers, walls, etc. and in the survey and design for a proposed downtown subway.

Following his work with the city, Lew became professor of civil engineering at the University of Pittsburgh, where for 13 years he was associated with highway engineering work, transportation, traffic control, reinforced concrete design, sewer design and sewage disposal, and water supply engineering.

Coincident with his work at the University, Mr. McIntyre filled nu-

(See McINTYRE, *page 492)*

Lawrence S. Tuttle was graduated from Stanford University in June 1928, receiving the degree of A.B. in Civil Engineering. Immediately upon completion of his university work at Stanford he joined the Division of Management of the then Bureau of Public Roads to engage in cost studies of highway contruction in the Western States. He has remained with the Public Roads Administration since that time, with the exception of a year's leave of absence in 1929 and 1930 to study traffic research and business administration at Harvard. In June 1930 he returned to the Public Roads Administration as a member of the Division of Highway Transport. After spending a few months on traffic surveys in Colorado, he was transferred to the Washington office, his official headquarters ever since. In the Division of Highway Transport he played an important part in establishing the Highway Planning Surveys as a permanent operating feature of every state highway department.

In 1939 Mr. Tuttle became assistant to the Commissioner of Public Roads, Mr. Thomas H. MacDonald, which is the position he now holds. In this capacity he has handled an array of widely varied problems in the field of administration, finance and highway engineering in general. The work has involved a great deal of time as liaison officer between the Public Roads Administration and

(See TUTTLE, *page 492)*

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- HIGHWAY SIGNS AND MARKERS
- STREET NAME SIGNS
- RAILROAD CROSSING SIGNS
- REFLECTOR BUTTONS

CATAPHOTE

CORPORATION,

TOLEDO, OHIO

(TUTTLE, *Con't from page 490*) numerous other governmental agencies. During the war years he was very closely associated with the Federal war agencies, and was instrumental in developing policies which governed wartime procedures concerning priorities and controlled materials in their application to highway construction and maintenance.

Among Mr. Tuttle's pioneering work in traffic engineering are researches in traffic circle design in which he and Mr. E. H. Holmes collaborated.

His duties in the field of transportation became extremely complex at one point some years ago when it is said that he constructed a boat in his living room. The problem of transporting the boat to the nearest water would have been much less complex, we are told, had the living room door been larger than the boat.

Mr. Tuttle was born in Hawaii and is the son of Dr. Tuttle who arose to international prominence through his work with leprosy.

His home, graced with the presence of four children, is in Arlington County, Virginia.

(McINTYRE, *Con't from page 490*) merous engagements as consulting engineer on streets, highways, housing, and hospital construction, with the then U. S. Bureau of Public Roads, Pennsylvania State Highway Department, American Engineering Council and various private organizations. He served with the Coast Artillery, U. S. Army, during World War I.

He was technical advisor to the Pittsburgh Better Traffic Committee during the preparation of one of the first downtown traffic surveys which resulted in the installation of the largest traffic signal system of its type in the country. He later became a consultant to the Bureau of Traffic Planning during the construction and installation of the signal system.

For five years Lew McIntyre was chief engineer of the Bureau of Traffic Planning, City of Pittsburgh. During his tenure the city won three traffic safety awards from the National Safety Council.

Since 1934 he has been a consulting civil engineer, has lectured at the University of Pittsburgh, and served as executive vice-president and manager of the Pittsburgh Motor Club.

While Lew McIntyre is well remembered as the Institute's third president, he may be even more renowned as the chief executive of what may now be a dormant organization within the Institute known as the "Sons of the Farmer's Daughter." Some ITE members know, and perhaps some do not, that this organization was founded by Mr. McIntyre at a convention of the Institute in Chicago some years ago "to take retributive action concerning a hoax perpetrated on a dozen or so members." Each member believed that he, and he alone, was the star of a skit entitled "The Farmer's Daughter."

Mr. McIntyre served three years in the African and Mediterranean Theaters during World War II as Provincial Commissioner in the Allied Military Government. He is still a Lieutenant Colonel in the reserve.

He is married and has two sons, both of whom served in World War II.

Among Lew's hobbies are home workshop and gardening, color photography and travel. He is a partner in the firm "Color Unlimited," commercial photo finishers. As to following his travel hobby, Mr. McIntyre is probably at this time somewhere in South Africa where he plans to visit some ten different countries this summer.

CUMULATIVE? Yes

The new Model G PARK-O-METER is interchangeable for either cumulative or wipe-off time at the flick of a lever in the mechanism.

UNIVERSAL? Yes

Model G PARK-O-METER permits instant interchange of dials: short time, 1-hour or 2-hour. Also affords 24 coin-time combinations.

AUTOMATIC? Yes

Naturally the New Model retains the modern, completely automatic operating mechanism that has set PARK-O-METER out in front.

DIE CAST CASE? Yes

The new die cast case gives improved protection against dust and moisture and adds a smooth beauty and brilliance.

RED ARROW COIN SLOT? Yes

The coin-slot marker, cast into the case, colored a brilliant red, adds to simplicity of operation, increases public acceptance.

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Without increase of one penny in cost, these new features give PARK-O-METER every advantage suggested by municipal officials throughout the nation. Every feature is incorporated in the engineered precision mechanism so that interchangeability to meet every need is instantaneous without use of extra parts. The durable, trouble-proof mechanism is designed for minimum maintenance time and expense. Many damaged parts are instantly replaceable without taking meter out of service.

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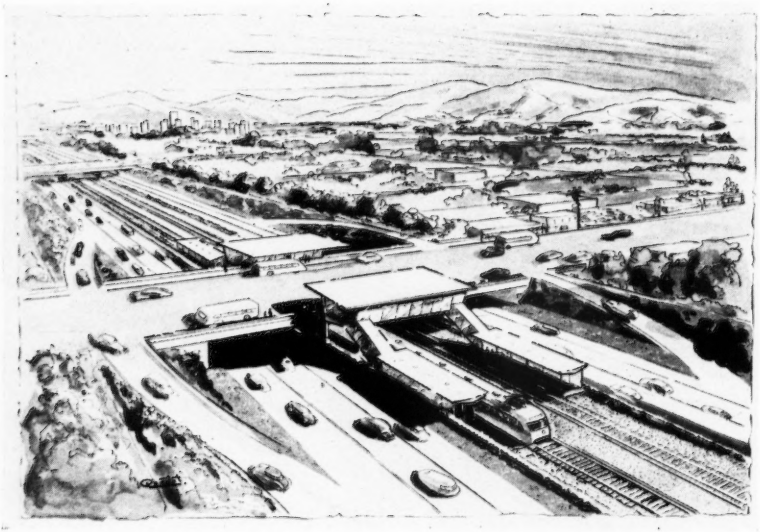

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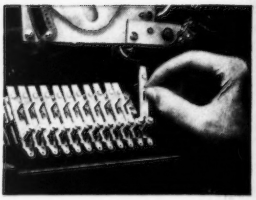

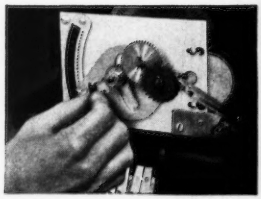

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